Remarks

Applicants thank the Examiner for examining the claims of the present application. Applicants also thank the Examiner for extending the courtesy of a telephone interview. A summary of the October 26, 2007, telephone interview is attached as Exhibit A.

By this amendment, Applicants are amending claims 1, 7, 8, 15, 27-31, 33, and 35. The amendments are supported in the Specification as filed at, for example, page 18, line 1, to page 19, line 19. With entry of this amendment, claims 1-19, 21-41 will be pending of which claims 21-26, 28-31, and 34-35 stand withdrawn. Applicants traverse all of the Examiner's rejections and request reconsideration of the application in view of the following remarks.

Independent Claim 1 Is Not Obvious Over *Sheen* In View of *Yukl*

The Examiner rejects claim 1 under 35 U.S.C. § 103(a) as being obvious over Patent No. 5,859,609 ("*Sheen*") in view of U.S. Patent No. 6,057,761 ("*Yukl*"). (Office action at pgs. 4-7.) The Examiner's rejection is traversed.

Solely to expedite prosecution, Applicants have amended independent claim 1. Amended independent claim 1 recites a system comprising:

> two or more arrays spaced apart from each other to define an interrogation region therebetween, the arrays each being structured to turn about the interrogation region to interrogate a person in the interrogation region with electromagnetic radiation at one or more frequencies in a range of about 200 MHz to about 1 THz to provide corresponding interrogation signals;
> one or more processors operable to establish data corresponding to a topographical representation of the person determined from the interrogation signals and generate an output as a function of the data, the topographical representation comprising a plurality of voxels that define a volume of the person in the interrogation region; and
> a device responsive to the output to provide an indication to an operator if the person is suspected of carrying one or more concealed objects that pose a threat to security,
> wherein the one or more processors are operable to generate the data corresponding to a topographical representation of the person by combining data sets corresponding to a number of different cylindrical images.

The Applicants respectfully submit that neither *Sheen* nor *Yukl* teaches or suggests "one or more processors . . . operable to generate the data corresponding to a topographical representation of the person by combining image data sets corresponding to a number of different cylindrical images" as

in amended independent claim 1.

By contrast, *Sheen* describes a reconstruction algorithm that forms an image from data obtained from a single, uncombined arc segment of a cylindrical aperture.

For instance, the summary section of *Sheen* states that "[a] completely new reconstruction algorithm is required to accept the wideband data gathered over <u>a section of the 360° cylindrical aperture</u> and form a fully focused three-dimensional image." (*Sheen*, col. 2, lines 8-21) (emphasis added.)

Further, in the detailed description portion of *Sheen*, *Sheen* states: "After digitizing, the reconstruction algorithm . . . is applied to <u>a segment of the 360° data</u> to reconstruct a three-dimensional image of the target <u>from a single viewing angle</u>. The three-dimensional image is then collapsed into a fully focused two-dimensional image of the target from a single viewing angle." (*Sheen*, col. 5, lines 31-37) (emphasis added.)

Still further, *Sheen* states: "The actual data processing of the . . . seven steps [described in *Sheen*] produces <u>a single image from a single viewing angle or arc segment of the 360° data</u>." (*Sheen*, col. 9, lines 35-37) (emphasis added.)

Sheen indicates that additional images may be formed using data from different arc segments, but each of these images is still generated by processing a single, uncombined arc segment of the 360° data. For example, *Sheen* explains: "for imaging a clothed person, an imaging sequence may use 90° arc segments overlapped in 10° increments, or 0°-90°, 10-100°, . . . , 350°-80°, to form 36 images with illuminations centered at 10° increments." (*Sheen*, col, 9, lines 39-43.)

Therefore, the reconstruction algorithm of *Sheen* uses data obtained from a single, uncombined arc segment of a cylindrical aperture to produce a three-dimensional image from a single viewing angle that is collapsed into a two-dimensional image from a single viewing angle.

The Examiner suggests that column 2, lines 27-30, of *Sheen* teaches the referenced element of amended independent claim 1. (Office action, pg. 4.) However, column 2, lines 27-30, of *Sheen* states: "Wideband data are gathered over a two-dimensional cylindrical aperture. The use of a cylindrical aperture overcomes the single viewing angle limitation present in a planar aperture system." Therefore, the cited section only indicates that a cylindrical aperture can be used to overcome the single viewing angle limitation of a planar aperture system. The cited section says <u>nothing</u> about how data from different viewing angles is processed. Instead, and as set forth above, *Sheen* clearly

indicates that the individual images generated by the *Sheen* algorithm are produced from single, uncombined arc segments of the 360° data—not from "combining image data sets corresponding to a number of different cylindrical images" as in amended independent claim 1.

Accordingly, *Sheen* does not teach or suggest that "the one or more processors are operable to generate the data corresponding to a topographical representation of the person by combining image data sets corresponding to a number of different cylindrical images" as in amended independent claim 1.

Yukl likewise does not teach or suggest "one or more processors . . . operable to generate the data corresponding to a topographical representation of the person by combining image data sets corresponding to a number of different cylindrical images" as in amended independent claim 1.

Yukl describes a security system that does not use any imaging, but rather uses the dielectric response of a subject to microwaves to determine the presence of weapons and contraband. (*Yukl*, abstract.) In fact, *Yukl* distinguishes imaging systems, noting that "imaging approaches to personnel screening tend to be invasive of a person's privacy and modesty. In other words, screening systems that image the person's body penetrate the person's clothes and highlight the person's physical attributes, effectively undressing the person." (*Yukl*, col. 1, lines 54-57.) To avoid the privacy issues associated with imaging techniques, the systems described in *Yukl* measure the dielectric response of a subject to microwaves and use "generic wire-frame human figure[s]" to show contraband on a subject. (*Yukl*, FIGS. 7A-7B; col. 8, lines 62-67; col. 9, lines 1-38.)

Because *Yukl* does not teach (and actually teaches away from) the use of imaging techniques, *Yukl* also does not teach or suggest "one or more processors . . . operable to generate the data corresponding to a topographical representation of the person by combining image data sets corresponding to a number of different cylindrical images" as in amended independent claim 1.

Accordingly, neither *Sheen* nor *Yukl* teaches or suggests "one or more processors . . . operable to generate the data corresponding to a topographical representation of the person by combining image data sets corresponding to a number of different cylindrical images" as in amended independent claim 1.

Because all claim limitations are not taught or suggested by the prior art, the Examiner's § 103(a) rejection of independent claim 1 should be withdrawn and such action is respectfully requested. (*See* MPEP 2143.04: "To establish *prima facie* obviousness of a claimed invention, all the

claimed limitations must be taught or suggested by the prior art.")

Dependent Claims 2-7, 27, and 37-38 Are Also Allowable

The Examiner rejects dependent claims 2-7, 37-38 as being obvious over *Sheen* in view of

Yukl. (Office action at pgs. 4-7.) The Examiner also rejects claim 27 as being obvious over *Sheen* in

view of *Yukl* in further view of U.S. Patent No. 5,720,708 ("*Lu*"). (Office action at pg. 7.) The

Examiner's rejections are all traversed.

Claims 2-7, 27, and 37-38 are dependent on amended independent claim 1 and are allowable

for at least the reasons stated above with respect to claim 1. Further, claims 2-7, 27, and 37-38 are

each independently patentable because of the unique and nonobvious features of the combinations set

forth in each claim.

Independent Claim 8 Is Not Obvious Over *Sheen* In View of *Yukl*

The Examiner rejects claim 8 under 35 U.S.C. § 103(a) as being obvious over Patent No.

5,859,609 ("*Sheen*") in view of U.S. Patent No. 6,057,761 ("*Yukl*"). (Office action at pgs. 4-7.) The

Examiner's rejection is traversed.

Solely to expedite prosecution, Applicants have amended independent claim 8. Amended

independent claim 8 recites a method, comprising:

> providing two or more arrays each shaped to turn about a person positioned
> between the arrays;
> operating the arrays to perform an interrogation of the person with
> electromagnetic radiation at one or more frequencies in a range of about 200 MHz to
> about 1 THz;
> generating a plurality of image data sets from the interrogation; and
> generating volumetric data by combining the plurality of image data sets, the
> volumetric data being indicative of the surface of the person.

The Applicants respectfully submit that neither *Sheen* nor *Yukl* teaches or suggests "generating

volumetric data by combining the plurality of image data sets, the volumetric data being indicative of

the surface of the person" as in amended independent claim 8.

By contrast, *Sheen* describes a reconstruction algorithm that forms an image from data obtained

from a single, uncombined arc segment of a cylindrical aperture.

For instance, the summary section of *Sheen* states that "[a] completely new reconstruction

algorithm is required to accept the wideband data gathered over a section of the 360° cylindrical aperture and form a fully focused three-dimensional image." (*Sheen*, col. 2, lines 8-21) (emphasis added.)

Further, in the detailed description portion of *Sheen*, *Sheen* states: "After digitizing, the reconstruction algorithm . . . is applied to a segment of the 360° data to reconstruct a three-dimensional image of the target from a single viewing angle. The three-dimensional image is then collapsed into a fully focused two-dimensional image of the target from a single viewing angle." (*Sheen*, col. 5, lines 31-37) (emphasis added.)

Still further, *Sheen* states: "The actual data processing of the . . . seven steps [described in *Sheen*] produces a single image from a single viewing angle or arc segment of the 360° data." (*Sheen*, col. 9, lines 35-37) (emphasis added.)

Sheen indicates that additional images may be formed using data from different arc segments, but each of these images is still generated by processing a single, uncombined arc segment of the 360° data. For example, *Sheen* explains: "for imaging a clothed person, an imaging sequence may use 90° arc segments overlapped in 10° increments, or 0°-90°, 10-100°, . . . , 350°-80°, to form 36 images with illuminations centered at 10° increments." (*Sheen*, col, 9, lines 39-43.)

Therefore, the reconstruction algorithm of *Sheen* uses data obtained from a single, uncombined arc segment of a cylindrical aperture to produce a three-dimensional image from a single viewing angle that is collapsed into a two-dimensional image from a single viewing angle. Accordingly, *Sheen* does not teach or suggest "generating volumetric data by combining the plurality of image data sets, the volumetric data being indicative of the surface of the person" as in amended independent claim 8.

Yukl likewise does not teach or suggest "generating volumetric data by combining the plurality of image data sets, the volumetric data being indicative of the surface of the person" as in amended independent claim 8.

Yukl describes a security system that does not use any imaging, but rather uses the dielectric response of a subject to microwaves to determine the presence of weapons and contraband. (*Yukl*, abstract.) In fact, *Yukl* distinguishes imaging systems, noting that "imaging approaches to personnel screening tend to be invasive of a person's privacy and modesty. In other words, screening systems that image the person's body penetrate the person's clothes and highlight the person's physical attributes, effectively undressing the person." (*Yukl*, col. 1, lines 54-57.) To avoid the privacy issues

associated with imaging techniques, the systems described in *Yukl* measure the dielectric response of a subject to microwaves and use "generic wire-frame human figure[s]" to show contraband on a subject. (*Yukl*, FIGS. 7A-7B; col. 8, lines 62-67; col. 9, lines 1-38.)

Because *Yukl* does not teach (and actually teaches away from) the use of imaging techniques, *Yukl* also does not teach or suggest "generating volumetric data by combining the plurality of image data sets, the volumetric data being indicative of the surface of the person" as in amended independent claim 8.

Accordingly, neither *Sheen* nor *Yukl* teaches or suggests "generating volumetric data by combining the plurality of image data sets, the volumetric data being indicative of the surface of the person" as in amended independent claim 8.

Because all claim limitations are not taught or suggested by the prior art, the Examiner's § 103(a) rejection of independent claim 8 should be withdrawn and such action is respectfully requested. (*See* MPEP 2143.04: "To establish *prima facie* obviousness of a claimed invention, all the claimed limitations must be taught or suggested by the prior art.")

Dependent Claims 9-14, and 32 Are Also Allowable

The Examiner rejects dependent claims 9-12, 14, and 32 as being obvious over *Sheen* in view of *Yukl*. (Office action at pgs. 4-7.) The Examiner also rejects claim 13 as being obvious over *Sheen* in view of *Yukl* in further view of *Lu*. (Office action at pg. 7.) The Examiner's rejections are all traversed.

Claims 9-14, and 32 are dependent on amended independent claim 8 and are allowable for at least the reasons stated above with respect to claim 8. Further, claims 9-14, and 32 are each independently patentable because of the unique and nonobvious features of the combinations set forth in each claim.

Independent Claim 15 Is Not Obvious Over *Sheen* In View of *Yukl*

The Examiner rejects independent claim 15 under 35 U.S.C. § 103(a) as being obvious over *Sheen* in view of *Yukl*. (Office action at pages 4-7.) The Examiner's rejection is traversed.

Solely to expedite prosecution, Applicants have amended independent claim 15. The amendment is not believed to narrow the literal scope of the claim. Amended independent claim 15

recites a method, comprising:

> generating electromagnetic radiation at one or more frequencies in a range of about 200 MHz to about 1 THz with two or more arrays to perform an interrogation of a person positioned between the two or more arrays;
>
> moving at least one of the arrays along a path about the person during the interrogation; and
>
> generating volumetric data from the interrogation to detect if the person is concealing an object, the act of generating the volumetric data including combining a plurality of cylindrical image data sets.

The Applicants respectfully submit that neither *Sheen* nor *Yukl* teaches or suggests "the act of generating the volumetric data including combining a plurality of cylindrical image data sets" as in amended independent claim 15.

By contrast, *Sheen* describes a reconstruction algorithm that forms an image from data obtained from a single, uncombined arc segment of a cylindrical aperture.

For instance, the summary section of *Sheen* states that "[a] completely new reconstruction algorithm is required to accept the wideband data gathered over a section of the 360° cylindrical aperture and form a fully focused three-dimensional image." (*Sheen*, col. 2, lines 8-21) (emphasis added.)

Further, in the detailed description portion of *Sheen*, *Sheen* states: "After digitizing, the reconstruction algorithm . . . is applied to a segment of the 360° data to reconstruct a three-dimensional image of the target from a single viewing angle. The three-dimensional image is then collapsed into a fully focused two-dimensional image of the target from a single viewing angle." (*Sheen*, col. 5, lines 31-37) (emphasis added.)

Still further, *Sheen* states: "The actual data processing of the . . . seven steps [described in *Sheen*] produces a single image from a single viewing angle or arc segment of the 360° data." (*Sheen*, col. 9, lines 35-37) (emphasis added.)

Sheen indicates that additional images may be formed using data from different arc segments, but each of these images is still generated by processing a single, uncombined arc segment of the 360° data. For example, *Sheen* explains: "for imaging a clothed person, an imaging sequence may use 90° arc segments overlapped in 10° increments, or 0°-90°, 10-100°, . . . , 350°-80°, to form 36 images with illuminations centered at 10° increments." (*Sheen*, col, 9, lines 39-43.)

Therefore, the reconstruction algorithm of *Sheen* uses data obtained from a single, uncombined

arc segment of a cylindrical aperture to produce a three-dimensional image from a single viewing angle that is collapsed into a two-dimensional image from a single viewing angle. Accordingly, *Sheen* does not teach or suggest "the act of generating the volumetric data including combining a plurality of cylindrical image data sets" as in amended independent claim 15.

Yukl likewise does not teach or suggest "the act of generating the volumetric data including combining a plurality of cylindrical image data sets" as in amended independent claim 15.

Yukl describes a security system that does not use any imaging, but rather uses the dielectric response of a subject to microwaves to determine the presence of weapons and contraband. (*Yukl*, abstract.) In fact, *Yukl* distinguishes imaging systems, noting that "imaging approaches to personnel screening tend to be invasive of a person's privacy and modesty. In other words, screening systems that image the person's body penetrate the person's clothes and highlight the person's physical attributes, effectively undressing the person." (*Yukl*, col. 1, lines 54-57.) To avoid the privacy issues associated with imaging techniques, the systems described in *Yukl* measure the dielectric response of a subject to microwaves and use "generic wire-frame human figure[s]" to show contraband on a subject. (*Yukl*, FIGS. 7A-7B; col. 8, lines 62-67; col. 9, lines 1-38.)

Because *Yukl* does not teach (and actually teaches away from) the use of imaging techniques, *Yukl* also does not teach or suggest "the act of generating the volumetric data including combining a plurality of cylindrical image data sets" as in amended independent claim 15.

Accordingly, neither *Sheen* nor *Yukl* teaches or suggests "the act of generating the volumetric data including combining a plurality of cylindrical image data sets" as in amended independent claim 15.

Because all claim limitations are not taught or suggested by the prior art, the Examiner's § 103(a) rejection of independent claim 15 should be withdrawn and such action is respectfully requested. (*See* MPEP 2143.04: "To establish *prima facie* obviousness of a claimed invention, all the claimed limitations must be taught or suggested by the prior art.")

Dependent Claims 16-20, 33, 36, and 39-41 Are Also Allowable

The Examiner rejects dependent claims 16-20, 36, 39-41 as being obvious over *Sheen* in view of *Yukl*. (Office action at pgs. 4-5.) The Examiner also rejects claim 33 as being obvious over *Sheen* in view of *Yukl* in further view of *Lu*. (Office action at pg. 7.) The Examiner's rejections are all

traversed.

Claims 16-20, 33, 36, and 39-41 are dependent on amended independent claim 15 and are allowable for at least the reasons stated above with respect to claim 15. Further, claims 16-20, 33, 36, and 39-41 are each independently patentable because of the unique and nonobvious features of the combinations set forth in each claim.

Claims 28-31 and 34-35

Pursuant to 37 C.F.R. § 1.141 and upon allowance of claims 1, 8, and 15, Applicants submit that they are entitled to consideration of claims 28-31 and 34-35.
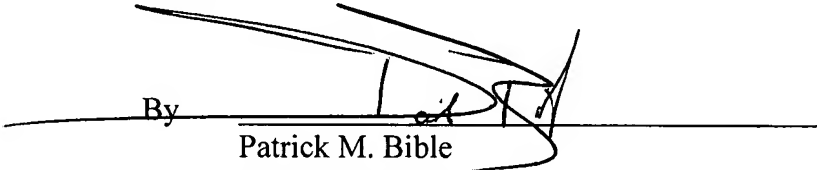
Conclusion

In view of the above amendment and remarks, this application is believed to be in condition for allowance and such action is respectfully requested. If any further issues remain concerning this application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,

KLARQUIST SPARKMAN, LLP

By

Patrick M. Bible
Registration No. 44,423

One World Trade Center, Suite 1600
121 S.W. Salmon Street
Portland, Oregon 97204
Telephone: (503) 595-5300
Facsimile: (503) 595-5301

Exhibit A

Examiner Interview Summary

Applicants thank Examiner Alsomiri for participating in a telephonic interview on October 26, 2007, and respectfully present the following summary of the substance of the interview.

During the interview, Applicants discussed U.S. Patent No. 5,859,609 ("*Sheen*") and U.S. Patent No. 6,057,761 ("*Yukl*"). More specifically, Applicants explained that the combination of *Sheen* and *Yukl* did not teach each and every element of independent claims 1, 8, and 15 as amended herein and for the reasons set forth above.